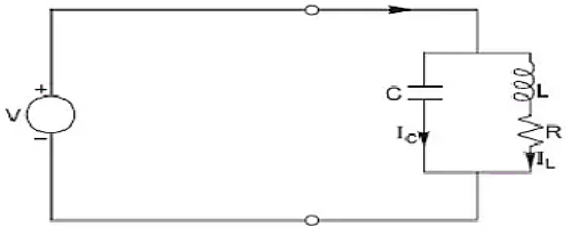
Tutoriel Work of Chapter 3: Electrical Circuit

Exercise N°1

Consider an RLC circuit supplied by a sinusoidal source and connected in parallel.

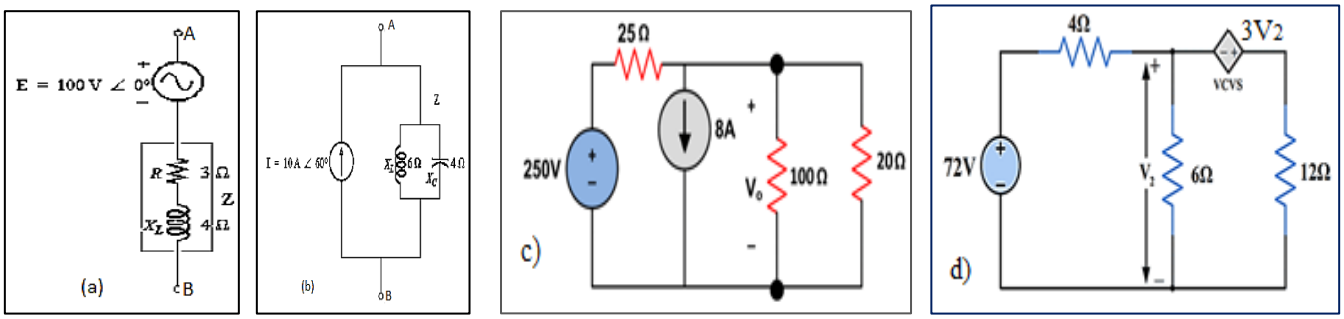


Given : R=60Ω
L=200mH
C=120nF

1- Calculate the equivalent admittance of the circuit.
2- Determine the resonant frequency

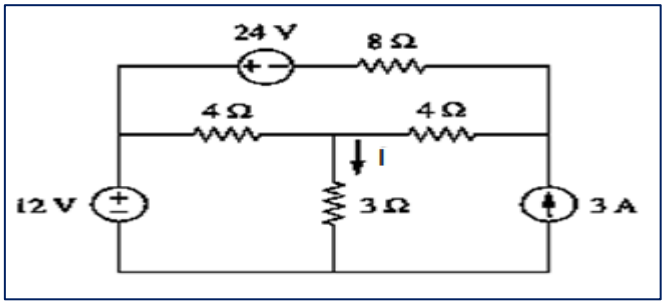
Exercise N°2

1- Convert the voltage source of Figure to a current source (fig a).
2- Convert the current source of Figure to a voltage source(fig b).
3- Find V_o using source Transformation (fig. c)
4- find v_2 in the following circuit using source transformation (fig.d).



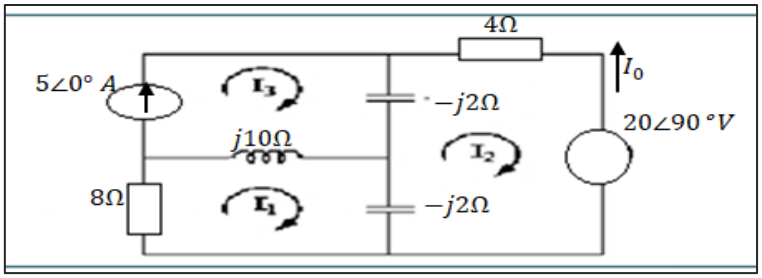
Exercise N° 3

Find I in the circuit of shown figure using superposition.



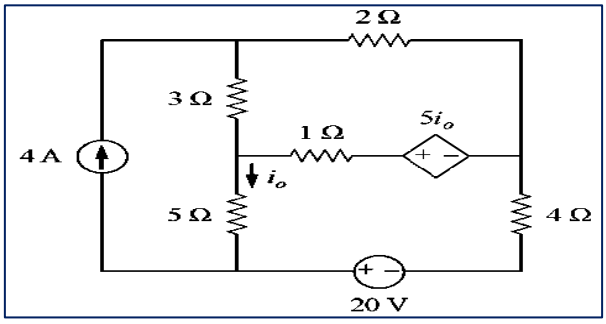
Exercise N°4

Use the superposition theorem to find I_0 in the figure shown.



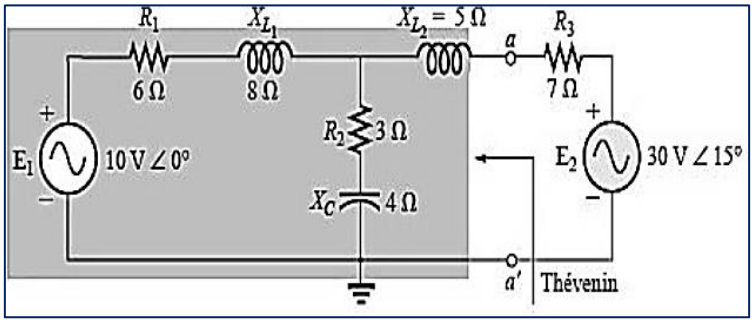
Exrecise N°5:

For the following circuit, determine the current i_o using superposition.



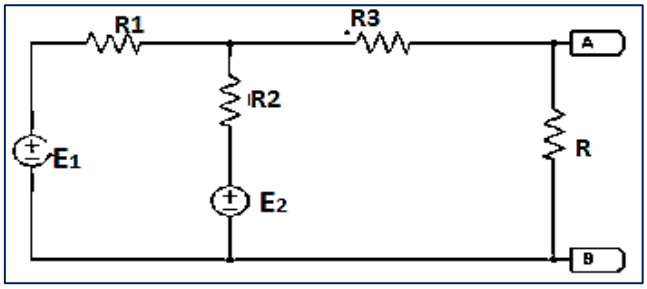
Exercise N°6

Find the Thevenin equivalent circuit for the portion of the network to the left of terminal a-a' in Figure.



Exercise N°7

Consider the following circuit:

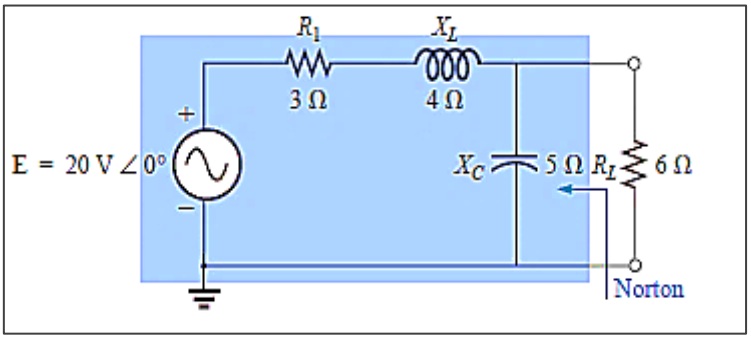


1- Find the equivalent Thévenin circuit as seen by terminals A and B
2- Calculate the value of the current flowing through resistance R and the voltage U across it.

Given: E_1=240 V, E_2=180V, R1=24Ω R2=16Ω, R3=6.4Ω and R=24Ω

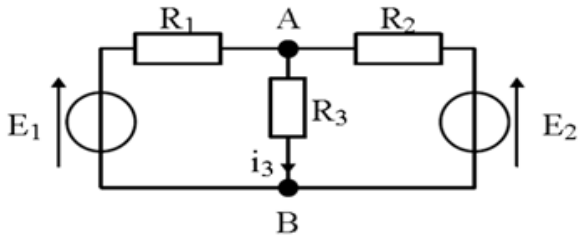
Exercise N° 8

Determine the Norton equivalent circuit for the network external to the 6 Ω resistor –the load charge)of the following circuit



Exercice N°9

Consider the following circuit:

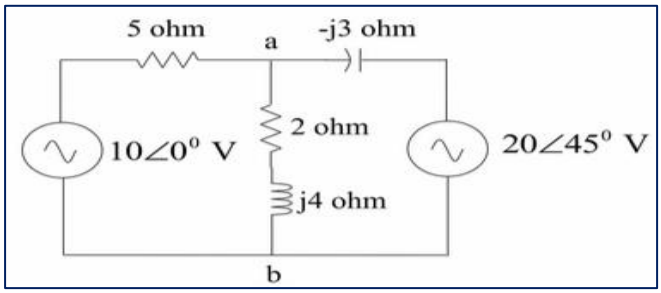


$E_1 = 10\ V, E_2 = 5\ V\ R_1 = 15\ k\Omega, R_2 = 10\ k\Omega$ and $R_3 = 5\ k\Omega$

1- Calculate the Norton equivalent Circuit of the AB dipole.
2- Deduce the value of i_3.
3- Derive the Thévenin equivalent diagram of this dipole.

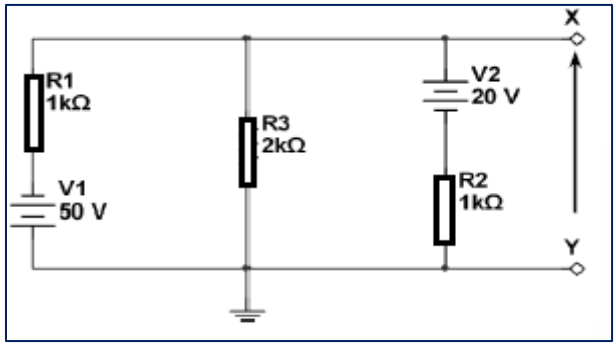
Exercise N°10

Using Millman's Theorem, find the current through the branch 'ab'



Exercise N°11

Determine the d.d.p. V_{XY}, V_{R1}, $V_{R2}$and V_{R3} for the electrical circuit shown opposite:



Exercise N°12

1- Consider the following circuit:

Given: $R_1 = 10k\Omega,\ R_2 = 5k\Omega, r = 1k\Omega$
$E_1 = 10V\ and\ E_2 = 10V$

Using the Kenelly transform (triangle-star transform), find the current intensities: $I, I_1\ and\ I_2$.

b- 2- Calculate the potentials $V_B, V_A, V_C\ and\ V_H$, taking point G as the reference point for the potential $V_G = 0$.